AMENDMENTS TO THE CLAIMS

1-18 canceled.

1   19. (previously presented) An apparatus for evaluating electrical properties of an earth

2   formation surrounding a borehole, the apparatus comprising:

3   (a)   a transmitting antenna assembly o for conveying a radio frequency

4   electromagnetic field into said earth formation; and

5   (b)   a receiving antenna assembly for receiving a signal resulting from

6   interaction of said electromagnetic field with said earth formation;

7   wherein at least one of the antenna assemblies includes at least one of: (I) a

8   magnetic core formed from a material having high internal magnetostrictive

9   damping, and, (II) low magnetostriction.

10

1   20. (previously presented) The apparatus of claim 19 wherein said material has a high

2   internal damping and further comprises a powdered soft magnetic material.

3

1   21. (previously presented) The apparatus of claim 20 wherein the powdered soft magnetic

2   material is non-conductive and has a maximum grain size to substantially reduce

3   intragranular power loss at a frequency of said radio frequency magnetic field.

4

1   22. (previously presented) The apparatus of claim 20 wherein the powdered soft magnetic

2   material has a maximum grain size less than half a wavelength of an acoustic

3   wave having a frequency of said radio frequency magnetic field.

4

1   23. (previously presented) The apparatus of claim 19 wherein said material has a high

2   internal damping and further has a large area within a hysteresis loop associated

3   with magnetostrictive deformation of the material.

4

1   24. (previously presented) The apparatus of claim 20 wherein said at least one antenna

2   core further comprises a non-conductive bonding agent having substantial

3   acoustic decoupling between grains.

4

1   25. (previously presented) The apparatus of claim 19 wherein said apparatus is adapted to

2   be conveyed on one of (i) a wireline, and, (ii) a drilling tubular.

3

1   26. (previously presented)The apparatus of claim 19 wherein said material has a low

2   magnetostriction and comprises an amorphous metal.

3

1   27. (previously presented) A method of determining a resistivity parameter of an earth

2   formation surrounding a borehole, the method comprising:

3   (a)   using a transmitting antenna assembly on a tool conveyed in said borehole

4   for transmitting a radio frequency electromagnetic field into said earth

5   formation;

6   (b)   using a receiving antenna assembly for receiving a signal resulting from

7		interaction of said electromagnetic field with said earth formation;
8	(c)	using a core for at least one of the antenna assemblies for enhancing the
9		received signals, said core formed from a material having at least one of
10		(I) high internal magnetostrictive damping, and, (II) low magnetostriction.
11		

1 28. (previously presented) The method of claim 27 wherein said material has a high

2 internal damping, the method further comprising using a powdered soft magnetic

3 material as said material with high internal damping.

4

1 29. (previously presented) The method of claim 28 further comprising selecting the

2 powdered soft magnetic material to be substantially non-conductive and having a

3 maximum grain size to substantially reduce intragranular power loss at a

4 frequency of said radio frequency magnetic field.

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1 30. (previously presented) The method of claim 28 further comprising selecting the

2 powdered soft magnetic material as having a maximum grain size less than half a

3 wavelength of an acoustic wave having a frequency of said radio frequency

4 magnetic field.

5

1 31. (previously presented) The method of claim 27 wherein said material has high

2 internal damping, the method further comprising selecting said material as having

3 a large area within a hysteresis loop associated with magnetostrictive deformation

4   of the material.

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1   32. (previously presented) The method of claim 28 further comprising using in said at

2   least one antenna core a non-conductive bonding agent having substantial acoustic

3   decoupling between grains.

4

1   33. (previously presented) The method of claim 27 wherein said material has a low

2   magnetostriction, the method further comprising selecting an amorphous metal for

3   use as said material.

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1   34. (previously presented) The method of claim 27 wherein said tool is conveyed into the

2   borehole on one of (i) a wireline, and, (ii) a drilling tubular.

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1   35. (previously presented) An apparatus for evaluating electrical properties of an earth

2   formation surrounding a borehole, the apparatus comprising:

3   (a)   a transmitting antenna assembly for conveying an electromagnetic field

4   into said earth formation; and

5   (b)   a receiving antenna assembly for receiving a signal resulting from

6   interaction of said electromagnetic field with said earth formation;

7   wherein at least one of said antenna assemblies includes at least one magnetic

8   core formed from a non-ferritic powdered soft magnetic material having high

9   saturation flux density and a non-conductive bonding agent, said magnetic core

10   having a magnetic permeability μ_m less than 500 and wherein said saturation flux

11   density is greater than about 0.4 T.

12

1   36. (previously presented) The apparatus of claim 35, wherein the magnetic core further

2   comprising dimensions which are related to the direction of an RF magnetic field

3   produced by the transmitter coil and to the magnetic permeability of the powdered

4   soft magnetic material.

5

1   37. (previously presented) The apparatus of claim 35 wherein the powdered soft

2   magnetic material is conductive and has a maximum grain size to substantially

3   prevent intragranular power loss of said transmitted electromagnetic signal.

4

1   38. (previously presented) The apparatus of claim 35 wherein an effective demagnetizing

2   factor of the magnetic core in a direction of the radio frequency magnetic field

3   substantially exceeds the inverse magnetic permeability of the powdered soft

4   magnetic material.

5

1   39. (previously presented)The apparatus of claim 36, wherein the core has an effective

2   permeability, μ, less than 5, as defined by a first equation,

3    $$\mu = 1 + (\mu_m - 1) / ((\mu_m - 1) \cdot D + 1),$$

4   wherein D, the demagnetizing factor can be estimated from an elliptic equivalent

5   of the cross-section of the core, as defined by a second equation,